



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

TRADEMARK SECTION

In re Application of:

Melvin A. Zehr

Serial No.: 10/010,177

Filed: 11/13/2001

Invention Bearing Shear Block

Examiner: Mark Rosenbaum

Attorney Docket No.: DIAZ114

**AFFIDAVIT OF CARL BONNER**

1. My name is Carl Bonner and I am the Research and Development Coordinator at Diamond Z Manufacturing, the Assignee of record in the above-titled invention.

2. I am presently the head of the Research and Development Department at Diamond Z Manufacturing. I have been involved in designing grinding machines for approximately eleven years. In this role, I am in charge of designing all of the systems of new grinding machines for Diamond Z Manufacturing. I was a principle designer for the design described by the patent application for the Bearing Shear Block, which is U.S. Patent Application Serial Number 10/010,177.

3. I have worked in various roles with heavy machinery for approximately thirty years. During this experience, I have gained skills in all phases of the technologies involved in building the tub and horizontal grinding machines at Diamond Z Manufacturing. My skills include welding, hydraulics, machining, fabricating, and designing.

4. In my position as Research and Development Coordinator for Diamond Z Manufacturing, I am familiar with many, if not all, commercial grinders that are on the market, including those of our competitors. These include tub grinders, horizontal grinders, grinders for wood, grinders for animal feed, and grinders for construction debris.

5. I have looked at U.S. Patent No. 4,082,232, to Brewer. Figure 1 of the Brewer application shows shear pins 84 which are between the motor M and the drive shaft 35 of the grinding device. In the Brewer application, it is not clear how big and heavy the shaft of the hammermill is, or how fast it is rotating. If the hammermill shown in Brewer is operating at a low speed, and the hammermill suddenly stopped, the shear pins 84 would snap and protect the motor and drive line from damage.

6. However, there are certain hammermills, such as those manufactured by Diamond Z, that operate at high speeds and heavy weights. These hammermills are designed to successfully shred such things as motor homes, construction debris and huge tree stumps. Such hammers operate at a speed of over 10,000 feet per minute at the tips of the hammers. The hammermill itself can weigh 13,000 pounds. The tips of the hammermill are typically ten- pound tips, which are bolted on. If one of these ten pound steel tips comes off, it might get wedged in the cutting mechanism and instantaneously stop the hammermill from rotating. This is more of a problem with horizontal grinders than tub grinders. In such a case, the main damage that can be done is to the hammermill shaft, if it distorts or bends.

Another thing that can be damaged are the bearings. Both of these are expensive and time consuming to replace. Replacing the hammermill shaft in particular is expensive to replace because it involves a lot of machining. The shear bolts of Brewer would not protect the hammermill shaft or the bearings holding the hammermill shaft. However, the shear pins of Brewer would protect the motor and the driveline. Repairing a destroyed mill shaft and bearings might cost \$5,000 to \$8,000 in parts and labor. The owner also faces a larger bill in downtime. He is typically making \$800 per hour for the machine, and it may be down for 10 to 14 days. At 10 hours a day, that could cost as much as \$112,000.

7. If the hammermill of Brewer were operating like a Diamond Z hammermill, at a speed of 10,000 to 11,000 thousand feet per minute speed at the tips, and with a weight of 13,000 pounds, if the hammermill instantaneously stopped, the hammermill shaft and it's bearings would be destroyed. The shear pins of Brewer do not prevent this.

8. The shear plates of our patent application do address this and are an entirely different kind of shear plate from any I have seen in the industry. We recently had a ten-pound hammer tip come off a machine and wedge in the cutter bar. It broke the bolts on the shear blocks, which are designed just as they are shown in the drawings of our patent application. The hammermill shaft came off, with its bearings attached, and did some damage to the wear plates, which surround the cutting area. However the hammermill shaft and both of its bearings were intact and undamaged. The machine could be repaired with minimal expense and downtime.

9. No other machine in the industry has this feature and any other machine in the industry would have had a destroyed mill shaft and bearings as a result of such a failure. If this were an obvious solution to this problem, other machines would have this feature.

I, the undersigned, further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application and any registration resulting therefrom.

DATED this 11 of March 2004.



Carl Bonner  
Research and Development Coordinator  
Diamond Z Manufacturing